

REMARKS

This preliminary amendment responds to the Final Office Action mailed November 23, 2001 and to the Advisory Action mailed March 18, 2002. In order to further the prosecution of this application, amendments have been made in the claims, and the following remarks are submitted.

Claims 19-31 were previously pending in this application. Claims 19, 20, 22, 23, 25, 29 are amended herein, and claim 24 has been canceled. Support for these amendments to these claims can be found in the original specification, as discussed in detail under item A. No new matter has been added. Claims 19-23 and 25-31 are now pending in the application, of which claim 19 is an independent claim. The application as presented is believed to be in allowable condition.

Applicants note with appreciation the indication of allowable subject matter in claims 26 and 28.

A. Rejection Under 35 U.S.C. § 112, first paragraph

In response to Applicants amendment after final, which was not entered in the parent case, an Advisory Action was issued. The Applicants herein address the issues raised by the Advisory Action. The Advisory Action states that the feature of a "non-conductive central core" is not supported by the specification as originally filed, and therefore raises the issue of new matter. Applicants respectfully disagree and traverse this rejection.

Applicants assert that the specification as originally filed included an embodiment of a cable having a non-conductive central core. For example, on page 3, lines 24-30, embodiments of a cable according to the invention are described, and in particular the cables are described as including a "core having a surface defining recesses within which each of the plurality of transmission media are disposed" and a "core having a surface with features which maintain a separation between each of the plurality of transmission media." In these embodiments, the core is not described as being conductive, indicating that the cable comprises a conductive core or a non-conductive core. The specification therefore provides support for the feature of a non-conductive core, as claimed in claim 19.

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The Advisory action states that the specification discloses that the core should be a conductive material or one containing a powdered ferrite, and asserts that the specification does not disclose a non-conductive core. Applicants respectfully disagree with this assertion. On page 4, lines 32 and 33, the specification states that the cable can be constructed using a number of different materials and that the invention is not limited to the materials given. The specification discloses, on page 5, lines 1-13, that the invention may be advantageously practiced by using a core material that is conductive or contains a powdered ferrite, and states that conductivity helps to further isolate the twisted pairs from each other. Thus, the specification does not require the core to be conductive, but rather states that having a conductive core will further reduce the cross-talk between pairs, compared to a cable constructed according to the invention, but not having a conductive core. Furthermore, the specification discloses on page 5, lines 4-5, that in non-plenum applications, the core can be formed of solid or foamed flame retardant polyolefin or a similar material, which are non-conductive materials. Therefore, while the specification discloses that a conductive core may provide additional benefits, and may be a preferred embodiment of the cable, the specification also discloses and provides support for a non-conductive core.

B. Rejections Under 35 U.S.C. §103

Claims 19-22 and 30-31 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Bleich et al. (5,576,515) in view of Prudhon (5,952,615). The Office Action asserts that Prudhon discloses a cable having a central core that comprises a plurality of fins that define a plurality of channels within which a plurality of pairs are individually disposed, each fin extending outwardly from a center of the core at approximately right angles to the other fins. The Office Action states that it would have been obvious to one skilled in the art to include the central core of Prudhon into the unshielded cable of Bleich to separate the pairs from each other to reduce crosstalk. Applicants have amended claim 19 to further clarify the distinctions of the claimed unshielded data cable over the asserted combination of Prudhon and Bleich, and respectfully traverse this rejection.

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Prudhon discloses three embodiments of a central rod (core) to be used in a shielded cable, each of which is a conductive rod. In a first example, Prudhon discloses the central rod comprising two metal tapes in a cruciform arrangement covered with insulation (col. 2, lines 61-63). As shown in Fig. 1, the edges of the tapes can be flush with the surface of the covering at the periphery of the rod to achieve continuity between the peripheral shield 13 and the interior tapes 15 (col. 3, lines 4-8). In a second example, shown in Fig. 3, Prudhon discloses the rod made up of a finned insulation material 31 which is extruded and externally metallized (col. 3, lines 9-11). Finally, Prudhon discloses that the rod 20-21 (Fig. 2) may be a semiconductor polymer material that increases in conductivity as the electric field increases, and which may further contain a conductive charge, for example, carbon black (col. 3, lines 38-42, and col. 4, lines 5-6). Thus, in each exemplary shielded cable, Prudhon discloses the central rod to be conductive.

Contrary to the asserted combination of the Office Action, one skilled in the art would not be motivated to combine the conductive rod disclosed in Prudhon with the unshielded cable disclosed in Bleich, because such a combination would result in the cable being rendered non-usable for its intended purpose due to deteriorated cable performance. The presence of a conductive rod in an unshielded cable would introduce a ground plane in close proximity to the unshielded twisted pairs. Since the twisted pairs typically have a thin insulation thickness required for 100 ohm impedance as known to those of skill in the art, the proposed combination would adversely affect electrical characteristics and performance of the twisted pairs and thus the cable. For example, as known to those of skill in the art, the pair impedance would be substantially reduced, and pair mutual capacitance and pair attenuation would be substantially increased. Furthermore, as known to those of skill in the art, the entire cable would be susceptible to external signals (alien crosstalk) due to the floating ground effect caused by the conductive core in an unshielded cable. In order to avoid or compensate for these effects, as known to those of skill in the art, the insulation of the twisted pairs would have to be increased, which would increase the overall diameter of the cable. As known to those of skill in the art, this would be particularly undesirable as the usual termination for unshielded cables is an RJ45 connector plug which requires the cable to have an outer diameter of less than 0.04 inches.

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Increasing the insulation thickness would likely increase the cable diameter such that the cable would no longer fit in the standard connector. Thus, the cable would be rendered non-usable for the intended application due to its decreased performance and its oversized physical dimensions. Therefore, for at least these reasons, one of skill in the art would not be motivated to place the conductive core of Prudhon into the unshielded cable of Bleich.

Additionally, at the time of the invention, the primary concerns for designers of unshielded twisted pair cables were return loss and impedance uniformity, not crosstalk. It was generally known in the art of unshielded data cables that the introduction of additional components (such as a central core) into an unshielded twisted pair cable generally worsens the return loss, makes manufacture more difficult, and adds to impedance non-uniformity. Thus, the addition of an additional member to an unshielded twisted pair cable would have generally been considered detrimental to the cable performance and undesirable, especially since there was no perceived need to increase crosstalk isolation in unshielded twisted pair cables.

Therefore, for at least the reasons discussed above, absent Applicants' own disclosure, there is no motivation or suggestion to one of skill in the art to combine the conductive core of Prudhon with the unshielded cable of Bleich, and the asserted combination is improper.

Furthermore, even if the asserted combination of references were proper, which it is not, in contrast to the conductive core disclosed in Prudhon, Applicants' claim 19, as amended to clarify one patentable distinction, recites "an unshielded data cable comprising...a non-conductive central core." Thus, Applicants' claim 19 patentably distinguishes over the asserted combination by reciting a non-conductive central core. Neither Prudhon nor Bleich, whether taken alone or in combination, disclose or suggest a non-conductive core, as is recited in Applicants' claim 19. Withdrawal of this rejection is therefore respectfully requested.

Claims 20-22, 30 and 31 depend, either directly or indirectly, from claim 19 and are therefore allowable for at least the same reasons as discussed for claim 19. Withdrawal of this rejection is thus respectfully requested.

Claims 23, 24 and 29 were rejected under 35 U.S.C. §103(a) as being unpatentable over Bleich et al. in view of Prudhon as applied to claim 19, and further in view of Hawley. The Office Action states that Hawley discloses fluoropolymer being a known material for being used

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in wire and cable insulation and being a noncombustible (fire resistant) material, and that is would thus have been obvious to one skilled in the art to use fluoropolymer for the modified central core of Bleich et al.

As discussed above, Applicants' claim 19 patentably distinguishes over the improper combination of Bleich and Prudhon suggested in the Office Action. Hawley fails to disclose or suggest an unshielded data cable comprising a non-conductive central core, and thus fails to cure the deficiencies of the asserted combination of Bleich and Prudhon. Claim 19, and thus claims 23, 24 and 29 which depend, either directly or indirectly, from claim 19, therefore patentably distinguishes over the asserted combination of Bleich, Prudhon and Hawley. Withdrawal of this rejection is therefore respectfully requested.

Claims 25 and 27 were rejected under 35 U.S.C. §103(a) as being unpatentable over Bleich et al. in view of Prudhon as applied to claim 19 and further in view of Gaeris et al. The Office Action asserts that Gaeris et al. discloses a cable comprising a central core including a central cavity in which a drain wire is disposed (col. 4, line 65). The Office Action asserts that it would have been obvious to one skilled in the art to provide the modified central core of Bleich et al. with a central cavity such that a drain wire (a metallic wire) or a strength member can be disposed to provide a grounding connection to the cable or to further support the finned element as taught by Gaeris et al.

As discussed above, Applicants' claim 19, and thus claims 25 and 27 which depend from claim 19, patentably distinguishes over the asserted combination of Bleich and Prudhon. Gaeris fails to disclose or suggest an unshielded data cable comprising a non-conductive central core, and thus fails to cure the deficiencies of the asserted combination of Bleich and Prudhon. Claims 25 and 27 therefore patentably distinguish over the asserted combination of Bleich, Prudhon and Gaeris. Withdrawal of this rejection is therefore respectfully requested

C. Conclusion

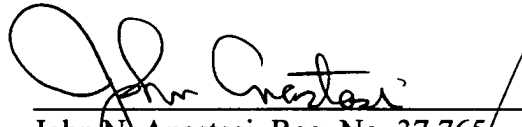
In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner

believes, after this amendment, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the number listed below.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No.: 23/2825.

Respectfully submitted,

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MARKED UP CLAIMS

19. (Amended) An unshielded data cable comprising:
a plurality of twisted pairs of conductors;
a non-conductive central core having a surface that defines a plurality of channels within which the plurality of twisted pairs of conductors are individually disposed;
an outer jacket that maintains the plurality of twisted pairs of conductors in position with respect to the non-conductive central core, the outer jacket being formed of a non-conductive material; and
wherein the unshielded data cable does not include a shield that encloses any of the plurality of conductors and the non-conductive central core.
20. (Amended) The unshielded data cable of claim 19, wherein the non-conductive central core comprises a plurality of fins extending radially outward from a center of the core to at least an outer boundary defined by an outer dimension of the twisted pairs of conductors.
22. (Amended) The unshielded data cable of claim 19, wherein the non-conductive central core comprises four fins, each fin extending radially outward from a center of the core at substantially right angles to at least one other of the four fins.
23. (Amended) The unshielded data cable of claim 19, wherein the non-conductive central core comprises:
at least one of a solid fluoropolymer, a foamed fluoropolymer, foamed polyvinyl chloride, and solid polyvinyl chloride; and
a filler that renders the central core conductive].
25. (Amended) The unshielded data cable of claim 19, wherein the non-conductive central core comprises a cavity.

29. (Amended) The unshielded data cable of claim 20, wherein the non-conductive central core comprising the plurality of fins is made of a fire resistant plastic.

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